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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/996,850	11/21/2001	Shi-Wai S. Cheng	GP-300576	4879

7590

08/12/2003

CARY W. BROOKS  
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Detroit, MI 48265-3000

EXAMINER
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MEDINA SANABRIA, MARIBEL

ART UNIT	PAPER NUMBER
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1754

DATE MAILED: 08/12/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application N

09/996,850

Applicant(s)

CHENG, SHI-WAI S.

Examiner

Maribel Medina

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-- Th MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 21 November 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-34 is/are pending in the application.
- 4a) Of the above claim(s) 22-34 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-21 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☒ Claim(s) 1-34 are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 21 November 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2,3.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

**DETAILED ACTION**

**Election/Restrictions**

1. Restriction to one of the following inventions is required under 35 U.S.C. 121:
  - I. Claims 1-21, drawn to a filtering process and filter system, classified in class 423, subclass 235.
  - II. Claims 22-34, drawn to a filtering system, classified in class 422, subclass 171.

The inventions are distinct, each from the other because of the following reasons:

2. Inventions I and II are related as process and apparatus for its practice. The inventions are distinct if it can be shown that either: (1) the process as claimed can be practiced by another materially different apparatus or by hand, or (2) the apparatus as claimed can be used to practice another and materially different process. (MPEP § 806.05(e)). In this case the process of claims 1 and 21 can be carried out in a different apparatus (filter system) such as the apparatus of instant claim 11, which doesn't require that the wall flow filter surround a portion of the catalyzed foam filter. Alternatively, the filter system of claims 22-34 can be used in a different process such as the treatment of VOCs-containing gaseous streams.
3. Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification and the search required for Group I is not required for Group II, restriction for examination purposes as indicated is proper.
4. During a telephone conversation with Cary W. Brooks on 7/30/03 a provisional election was made with traverse to prosecute the invention of Group I, claims 1-21. Affirmation of this election must be made by applicant in replying to this Office action. Claims 22-34 have been

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withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

**Drawings**

5. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(4) because reference character "104" has been used to designate both "rear face" (See page 7, lines 21, 22, and 30 and page 8, line 1) and "cavity" (See page 6, line 28 and page 8, line 1). A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

**Claim Rejections - 35 USC § 102**

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. Claims 1-5, 7, 8, 10, 11-15, 17, 18, 20 and 21 are rejected under 35 U.S.C. 102(b) as being anticipated by US Patent No. 4,426,320 (Ernest et al) as evidenced by US Patent No. 4,902,487 (Cooper et al).

In regards to claims 1, 11 and 21, Ernest et al disclose a filtering process and filter system for treating exhaust gases from diesel engines (See col. 1, lines 7-10 and 21-23). The process comprises flowing the exhaust gases through a coarse filter (instant first section) and then through a fine filter (instant second section-wall flow filter) (See col. 1, lines 28-31). The filters may be a refractory material, having an open cell structure with a plurality of interconnected voids (See col. 2, lines 9-32) and effective to trap particulates in the exhaust such as carbon

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particles (See col. 1, lines 7-10; 32-33; and 49-53). The filter may be a refractory ceramic monolith or ceramic foams and it further comprises a catalytic material effective for the conversion of carbon and gaseous pollutants in the exhaust gases (See col. 1, line 45 to col. 2, line 32). The catalytic material is an oxidation catalyst, effective for the conversion of hydrocarbons, carbon monoxide and nitrogen oxide (See col. 3, lines 56-60) and the combustion of carbon particles (see col. 3, lines 37-46).

Ernest et al is silent about the reactions of the limitations of claims 1 and 21 that read "to promote the conversion of NO in the exhaust from the diesel engine to NO<sub>2</sub>, and to promote the reaction of at least a portion of the particulates trapped on the foam with NO to form CO and NO, and wherein the first catalyst carried by the foam further promotes the oxidation of CO to CO<sub>2</sub>, and the oxidation of NO, generated by the reaction of NO<sub>2</sub> with carbon, to generate additional NO<sub>2</sub>" and "and the wall flow filter being constructed and arranged to trap particulates in the exhaust and to promote the reaction of NO<sub>2</sub> and C to produce NO and CO".

However, the reactions are inherently present in the process of Ernest et al, since Ernest et al disclose the conversions of CO and NO and the combustion of carbon particles from diesel engine exhaust gases.

Cooper et al is provided as evidence to show that the reactions of the above cited limitations occur on the diesel engine exhaust gases once they are contacted with a catalytic material on a ceramic monolith as instantly claimed (See col. 2, lines 15-21).

Cooper et al disclose, in col. 2, lines 1-52, that diesel engine exhaust gases usually includes NO, O<sub>2</sub>, CO, CO<sub>2</sub>, H<sub>2</sub>O and SO<sub>2</sub> as well as unburnt hydrocarbons and carbonaceous particulate. The NO is converted to NO<sub>2</sub>, which is the oxidant necessary to combust the

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carbonaceous particulate. The followings reactions occur:  $\text{NO} + \frac{1}{2} \text{O}_2 \rightarrow \text{NO}_2$  and  $\text{NO}_2 + \text{C} \rightarrow \text{NO} + \text{CO}$ .

Note that the secondary reference (Cooper et al) is only provided as evidence to show that the reactions are inherently present in Ernest et al process. "To serve as an anticipation when the reference is silent about the asserted inherent characteristic, such gap in the reference may be filled with recourse to extrinsic evidence. Such evidence must make clear that the missing descriptive matter is necessarily present in the thing described in the reference, and that it would be so recognized by persons of ordinary skill." (See *Continental Can Co. USA v. Monsanto Co.*, 948 F.2d 1264, 1268, 20 USPQ 2d 1746, 1749 (Fed. Cir. 1991).

In regards to claims 2-4 and 12-14, Ernest et al disclose in col. 2, lines 1-8, that the refractory oxide material or ceramic foam comprises alumina and zirconia or combinations thereof.

In regards to claims 5 and 15, Ernest et al disclose in col. 3, lines 37-66, that the catalytic material may be platinum.

In regards to claims 7, 8, 17 and 18, Ernest et al disclose in col. 2, lines 61-65, that the filter have porosity in the range from 80 to 95 % and a pore size in the range from about 2 to about 50 pores/mm (4-51 pores/in).

In regards to claims 10 and 20, Ernest et al disclose in col. 5, lines 46-47 that the sections are enclosed in a housing.

No difference is seen between the instantly claimed invention and Ernest et al disclosure.

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**Claim Rejections - 35 USC § 103**

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 6 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ernest et al.

Ernest et al apply here as above. In regards to claims 6 and 16, Ernest et al disclose in col. 5, lines 36-41 a catalyst material content in the range of about 1 to about 50 % based upon the weight of the filter. However, fail to disclose that the platinum is carried by the foam in a loading of at least 25 gram per cubic feet of foam.

Ernest et al disclose "The amount of the catalyst material that is coated on the filters depends on economics, size limitations and design characteristics."

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have selected any loading rate of platinum on the foam such as the instantly claimed range, since Ernest et al disclose that the concentration of the catalyst material depends on economics, size limitations and design characteristics.

10. Claims 9 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ernest et al as applied to claims 1-5, 7, 8, 10-15, 17, 18, 20 and 21 above, and further in view of US Patent No. 5,183,608 (Guile).

Ernest et al apply herein as above. Ernest et al disclose a second section including a fine filter (instant wall flow filter). The filter may be a refractory inorganic oxide such as a ceramic

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monolith, having an open cell structure with a plurality of interconnected voids (See col. 2, lines 9-32).

In regards to claims 9 and 19 Ernest et al fail to disclose that the fine filter (instant wall flow filter) includes 25 to 300 cells per square inch of cross-sectional area of the wall flow filter.

Guile is relied upon to teach an open cell filter to treat diesel engine exhaust gases comprising between 1.4 cells/square centimeter to about 144 cells/square centimeter (144-929 cells per square inch) (See col. 1, lines 12-2 and col. 5, lines 49-61).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have used the open cell filter taught by Guile in the process of Ernest et al, since Ernest et al disclose the use of any known open cell filter and since Guile et al teaches that open cell filters having 144-929 cells per square inch are used in the treatment of diesel engine exhaust gases in order to remove particulates.



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**Conclusion**

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Maribel Medina whose telephone number is (703) 305-1928.

The examiner can normally be reached on Monday through Friday from 7:30 AM to 3:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stanley Silverman can be reached on (703) 308-3837. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

*Maribel Medina*  
Maribel Medina  
Examiner  
Art Unit 1754

MM  
August 6, 2003